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AUTHOR	Mitchell, Barbara J.
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ABSTRACT

This booklet, the fourth in a series of four volumes on the Designing a Curriculum (Dacum) process, is intended to assist instructors and trainers in examining some of the issues involved in translating a Dacum chart and curriculum objectives into an instructional program. Discussed first are various points of view as to where program development ends and instructional design begins. Procedures are set forth for translating curriculum guidelines into an instructional plan, analyzing objectives, selecting instructional techniques, choosing instructional resources, and evaluating learning and instruction. Covered next are the craft and art of instructing adults as well as the following four British Columbian programs for adult educators: the Instructor's Diploma Program (an in-service for postsecondary and certain secondary teachers), Introduction to Teaching Adults (a self-help program), the Instructional Skills Workshop Program for Postsecondary Instructors, and the Teaching Techniques Series (a series of videotapes and booklets). The services of the British Columbia Provincial Postsecondary Resource Centre are described. Concluding the booklet is an annotated list of some commercially available materials on the subject of competency-based education and its implications for instruction. (MN)

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For further information contact

Director of Research and Curriculum Development
Post-Secondary Department
Ministry of Education
7451 Elmbridge Way
Richmond, B.C. V6X 1B8
Telephone: (604) 278-3433

Copies of the Dacum booklets can be ordered from

Publication Services Branch
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878 Viewfield Road
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Please read the first booklet in this series, **An Introduction to Dacum,** *for a general description of the Dacum system.*

Preface

This four-part series explains Dacum, an acronym for Designing a Curriculum. Dacum is a systematic method for developing career, technical, and vocational training programs. Modified versions of the Dacum model are used in a number of provinces across Canada by educational institutions, government agencies, and business and industry. In British Columbia, Dacum is used by the Research and Curriculum Development Branch of the Ministry of Education to develop curricula at the post-secondary level.

The four booklets in this series provide a detailed description of the major steps involved in the Dacum process. The booklets are:

1. **Introduction to Dacum**
2. **The Dacum Workshop**
3. **From Skill Profile to Objectives**
4. **From Objectives to Instruction**

The materials are designed for workshop participants, program developers and others in the training field.

This booklet, **From Objectives to Instruction,** examines some of the issues involved with translating a Dacum chart and the curriculum objectives into an instructional program. It is written primarily for instructors and trainers whose responsibility it is to implement curriculum. The booklet identifies some of the constraints affecting the process of instructional design. It briefly reviews the procedures for developing instructional plans and identifies programs, resources, and materials designed to assist instructors with their own professional development.

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Project Director:
Sandy McGechaen

Researcher/Writer:
Barbara J. Mitchell

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Where Did All the Handouts Go?

Just where curriculum or program development ends and instructional design begins is an ongoing source of debate. For some, designing a curriculum means identifying skills, setting objectives, designing instructional plans, developing evaluation instruments, and creating all the resources (handouts, films, texts, etc.). In short, packaging an entire course or program ready for delivery.

For others, curriculum design is complete when the objectives and standards for the program have been mapped out; that is to say, when the "working drawings and specifications" are complete but "construction" has not yet begun.

The Dacum system, as it has been practised in British Columbia, has generally been associated with the packaging model. The Travel Counselling Techniques program developed by the Ministry of Education in 1976 is one example of a packaged curriculum. It includes a skill profile chart, an instructor's manual complete with objectives, lists of instructional techniques, a full kit of resource materials, and a complete set of evaluation instruments.

In recent years, the Ministry of Education has acknowledged the impracticability of fully developing and packaging curriculum materials for all of the 400 or more post-secondary career, technical, and vocational programs which are part of its responsibility. Instead, the Ministry has endeavoured to address the most pressing development needs, particularly in the primary resource, hospitality, and health-related fields.

Curriculum guidelines in the form of skill profile charts (Dacum charts) and outlines of objectives, have been developed in collaboration with employer groups, other Ministries and several colleges and institutes.

The translation of these curriculum guidelines into instructional programs has become the responsibility of individual instructors or program development groups in the colleges and institutes.

To assist with local program development, the Ministry funds a number of programs specifically for instructors, which were created to provide training in instructional design and to improve and enhance the practice of instruction.

This booklet relates Dacum, as it is now practised provincially, to the general elements of *instructional design* and provides detailed in-

formation about programs and resources available to instructors who wish to improve their range of *instructional skills.*

Translating the Curriculum Guidelines

Translating a Dacum curriculum into an instructional plan is a less complicated process than starting from scratch, because the instructor begins with a set of clear outcomes which have already been developed and validated by the field. In addition, the curriculum guidelines may include a list of objectives which the instructor can use as models, to develop more precise instructional objectives. Even with the curriculum aids, writing instructional objectives is never easy. It requires a good deal of skill to analyze the outcome and identify behaviours that a learner may reasonably be expected to achieve within the training program.

Several factors influence the process of instructional design. Some can be controlled by the instructor, while others cannot. Constraints imposed by the organization of the training facility itself present external controls which instructors must consider when they design instruction. For example, most colleges and institutes in B.C. offer training through the class method, where learners are brought together into groups to receive formal instruction. Some organizations, such as the Open Learning Institute, use an individual method called *distance learning,* where learners work on their own, having only minimal contact with tutors. The method chosen to deliver education restricts the choice of outcomes to those which can be achieved by that method.

Another external factor that influences instruction is time. It has been said that Dacum would be an ideal system if people had all the time in the world to learn, but time is in short supply in post-secondary education. All training programs must produce graduates as quickly as possible to meet the needs of industry and the professions. This constraint puts particular pressure on instructors to identify those competencies which are critical to the needs of the learner and can reasonably be achieved within the time allocated for the program.

Even the standards set for the competencies may need to be modified to fit within the time constraints.

Besides the external constraints influencing the process of translating a Dacum curriculum outline into an instructional program, there is another element which affects the process—the instructor's skill in the design and management of instruction. Since Dacum now aims to make instructors responsible for translating the curriculum in the instructional setting, it is important for instructors to develop a fair degree of skill in the process of design. A number of programs and services for helping instructors with their professional development are described later in this booklet.

Instructional design is a complex process—too complicated to cover adequately here. Nevertheless, it would be useful to briefly describe the basic steps in developing an instructional plan. An instructor, presented with a Dacum skill profile and a list of objectives, might follow these steps to design an instructional program:

1. Analyze each objective to determine the steps a learner must go through to achieve it. These steps are called learning tasks.
2. Determine the type of learning outcome that each task represents. It may be verbal information (knowing what), an intellectual skill (applying rules), a cognitive strategy (creative problem solving), attitudes, or motor skills.
3. Select the best possible instructional techniques to assist learners to achieve the outcome of the task.
4. Choose the best available resources to aid learners during the instructional process.
5. Determine when, how, and what kind of evaluation is necessary to ensure that learning has taken place.

Analyzing the Objectives—the Critical Step

This first step is the key to success in instructional design. Whereas the choice of how to teach and which aids to use are sometimes a matter of individual preference, what must be learned in order to achieve a particular objective is not. The purpose of analyzing an objective, therefore, is to determine the most appropriate learning tasks and to use them as a basis for making instructional decisions.

Table 1 illustrates the breakdown of an objective written for a waiter/waitress training program. Notice that the learning tasks represent types of learning outcomes. A learner able to accomplish each of the learning tasks should, with practice, be able to put them all together to achieve the stated objective.

TABLE 1
Sample Objective

General Area of Competence: Serve Alcoholic Beverages
Enabling Skill: Serve Mixed Drinks
Objective: In a simulated situation, the learner will serve a variety of mixed drinks to a table of six, so that each person receives the correct drink, appropriately garnished and accessorized.

Learning Tasks	Type of Learning Outcome
List the major types of distilled spirits.	Verbal Information
Describe the most frequently ordered types of "Highballs."	Verbal Information
Identify the ingredients (including the mixer and garnishes) for the most frequently ordered mixed drinks.	Intellectual Skill
Select the appropriate glass for a given type of drink.	Intellectual Skill
Garnish and accessorize drinks for attractive presentation.	Intellectual Skill
Load and carry a tray of drinks (without spillage!).	Motor Skill
Serve drinks in a professional, courteous manner.	Attitude

From the breakdown in table 1, a skilled instructor in a waiter/waitress training program should be able to determine quite readily the most effective and efficient way of instructing students, and what information and resources are required in order to do so.

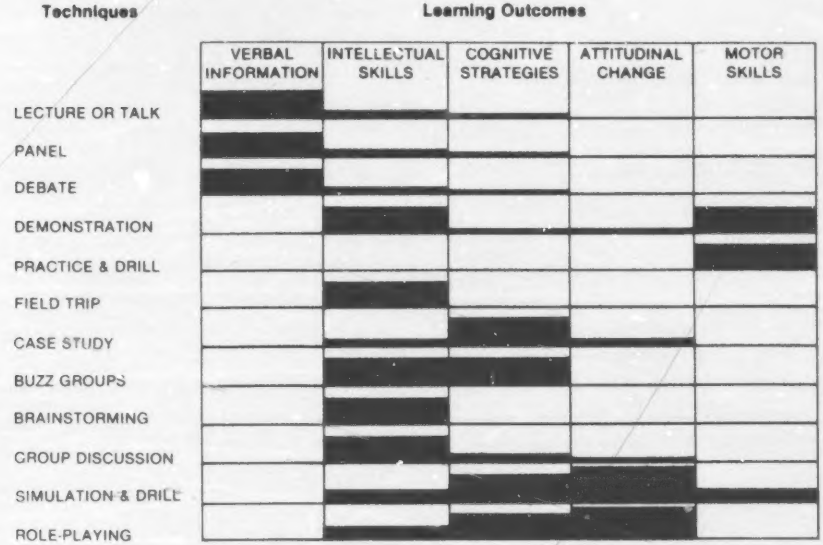
It is important to recognize that objectives vary greatly in degree of complexity, depending on their nature and scope.

Selecting Instructional Techniques

The range of possible techniques of instruction is theoretically as wide as the number of individuals practicing the profession. Some of the most "tried and true" are illustrated in table 2, taken from **Introduction to Teaching Adults**—a series of instructional self-help publications developed at the University of British Columbia.

TABLE 2
Guidelines for Selecting Techniques*

How to use this chart: All techniques are capable of aiding more than one learning outcome, but some are more useful than others for specific purposes. The wider the bar, the more likely it is that the learning outcome will be achieved by the use of the technique. For example, if problem-solving behaviour (a cognitive strategy) is one of the learning outcomes and change in attitude is desired but not essential, then perhaps a case study would be an effective way to elicit this behaviour.



* From **Introduction to Teaching Adults, Module 2—Using Instructional Techniques**, Centre for Continuing Education, University of British Columbia, 1981.

Choosing Instructional Resources

The choice of tools, equipment, learning materials, and media aids depends, in large measure, on the instructional techniques chosen for each objective. The number of possible choices is broad. Some of the most commonly used instructional resources are:

Textbooks
Information sheets
Overhead transparencies
Slides
16 mm films
35 mm film strips
Videotape
Audio cassettes
Working modules
Simulation games
Computer programmed "software" packages

The constraints of budget and availability of equipment and materials will, of course, affect the choice as well. For a more detailed discussion of instructional resources, see **Introduction to Teaching Adults, Module 3—Using Instructional Media.**

Evaluation of Learning and Instruction

Measuring learner progress towards the achievement of objectives is accomplished by using evaluation instruments. In competence-based instruction, these instruments generally include both paper and pencil tests for knowledge, and skills tests for performance (the application of knowledge).

Tests are designed to reflect the criteria stated in the objective. A valuable instructional resource in themselves, tests may be used to provide ongoing feedback to both learners and instructors during the learning process (formative evaluation) as well as to measure final achievement of objectives at the end of instruction (summative evaluation).

Typically, paper and pencil tests include one or more of the following types:

Multiple-choice questions
True/false choices
Sentence completion
Matching questions
Short or long essay responses

Skills tests may include the use of checklists and rating scales in:

Simulations
Role-plays
Observations in a practicum setting

Judging a learner's overall competence requires a weighting between both types of test results to see if all the objectives have been reached.

"Seems like a lot of work! What are the rewards?"

Instructors who have taken the time to work through the steps of instructional planning report that the process has been extremely useful when it came time to actually teach the program. Not only does a well-thought-out plan give the instructor a clear sense of direction, but it also provides a useful resource for communicating that direction to the learners.

The Craft and the Art of Instructing Adults

The old saying "Those who can't do, teach," does a terrible injustice to an ancient and honourable profession. In addition to being highly competent in a trade, profession or specialized discipline, today's instructors must also be competent in the increasingly sophisticated craft and art of instruction. The process of designing and planning instruction, based on current learning theory, is the craft of instruction. Implementing the design plan in person, or at one step removed through the use of print and telecommunications media, is where the art of instruction comes in.

A number of excellent resources are available to assist individuals who wish to develop or refine their skills in instructional design and practice. For convenience, these are classified in the following pages as Programs for Instructors, Provincial Resources, and Commercial Materials.

Programs for Instructors

Instructor's Diploma Program

The Instructor's Diploma Program has been designed to provide in-service training for instructors in colleges and provincial institutes, and of certain approved specialties in secondary schools. The program is also open to instructors in private schools and trainers in industry.

The program is co-sponsored by the Post-Secondary Department of the Ministry of Education, and the Centre for Continuing Education at the University of British Columbia.

Candidates who complete the program receive a Ministry of Education diploma, endorsed to show the subject area and type of institution in which they instruct. The diploma is a valid teaching certificate in the Province of British Columbia.

The four courses that make up the I.D. Program have been designed to combine self-study with classroom-style learning and provide practical assistance in all areas of instruction.

The first course provides an overview to introduce new instructors to the profession. The second course examines the principles and practice of designing and managing instruction. The third deals with

the design and use of audiovisual materials, and the fourth with methods for evaluating learning.

For further information, please contact:

Instructor's Diploma Program
Centre for Continuing Education
5997 Iona Drive
University of British Columbia
Vancouver, B.C. V6T 2A4
Telephone: (604) 228-2181

Introduction to Teaching Adults

Introduction to Teaching Adults is a self-help program made up of eleven modules covering just about every aspect of instruction.

1. **Guidelines for Teaching of Adults**
2. **Using Instructional Techniques**
3. **Using Instructional Media**
4. **Using Evaluation Instruments**
5. **Designing Instruction**
6. **Writing Instructional Objectives**
7. **Managing Instruction**
8. **Enhancing Motivation**
9. **Understanding the Adult as Learner**
10. **Understanding the Learning Process**
11. **Continuing Your Development**

The modules are made up of workbooks and cassette tapes. They are designed for anyone interested in teaching who would like to work on their own at home to develop some skills in the design and management of instruction.

The series can be purchased as a reference guide, or, for an extra fee, it can be taken as a correspondence course. Those who complete the course receive credit for their work with the Centre for Continuing Education at U.B.C.

For further information, please contact:

Introduction to Teaching Adults Program
Centre for Continuing Education
5997 Iona Drive
University of British Columbia
Vancouver, B.C. V6T 2A4
Telephone: (604) 228-2181

Instructional Skills Workshop Program for Post-Secondary Instructors

The Instructional Skills Workshop, funded and coordinated through the Ministry of Education, is a highly compact program for instructor development, based on a peer training model (that is, experienced instructors working with other instructors on-site in their own institution). A workshop session may take place over four consecutive days, or it may be spread out over a number of weeks in shorter sessions, depending on the particular needs of the group.

The Instructional Skills Program focuses on both instructional design and management. Participants are given the opportunity to practise design skills and instructional techniques, with constructive feedback offered immediately by the facilitator and fellow participants. Video taping is an important element of the program.

Skill-building sessions include: Writing Performance Objectives, Lesson Planning, Evaluation, and Conducting Instruction (with particular emphasis on participatory techniques of instruction).

For further information, please contact:

Coordinator of Professional Development
Research and Curriculum Development Branch
Ministry of Education
7451 Elmbridge Way
Richmond, B.C. V6X 1B8
Telephone: (604) 278-3433

Teaching Techniques Series

This is a series of videotapes and booklets demonstrating and describing the art of instruction. The series, produced at Capilano

College under contract to the Ministry of Education, "stars" experienced instructors from B.C. Colleges and Institutes.

The following areas of interest to instructors are examined in the series:

Beginning: identifies areas of common concern to new instructors and offers suggestions for overcoming both real and imagined problems.

Learning: includes a detailed look at the learning environment and discusses theories of learning.

Questioning: looks at different types of questions and ways in which the questioning process may best be used.

Evaluating: closely examines techniques of evaluation and gives many hints about how to evaluate effectively.

Instructional Aids: discusses the effective use of training aids.

Three additional programs are presently being added to the series: **Small Group Learning, Video in Instruction,** and **Planning and Delivery of a Lesson.**

Tapes and booklets are available for individual use in most college and institute audiovisual centres.

For further information, please contact:

Coordinator of Professional Development
Research and Curriculum Development Branch
Ministry of Education
7451 Elmbridge Way
Richmond, B.C. V6X 1B8
Telephone: (604) 278-3433

Provincial Resources

The Provincial Post-Secondary Resource Centre is a service provided by the Ministry of Education to anyone involved with the development and delivery of post-secondary training. It is connected to libraries and resource centres throughout British Columbia on the inter-library loan network.

Course outlines, Dacum charts and a variety of reference materials may be borrowed, along with materials developed by B.C. colleges and institutes. Requests for materials or information may be made in person, by phone, by mail, or by telex.

Provincial Post-Secondary Resource Centre
Ministry of Education
7451 Elmbridge Way
Richmond, B.C. V6X 1B8
Telephone: (604) 278-3433
Telex: 04-357797

The Publication Services Branch of the Ministry of Education stocks a large number of Ministry publications which are sold at minimal cost to secondary and post-secondary institutions. Orders can be placed by telephone or in writing.

Publication Services Branch
Ministry of Education
878 Viewfield Road
Esquimalt, B.C. V9A 4V1
Telephone: (604) 387-5331

Research and Curriculum Development, a branch of the Ministry of Education Program Services Division, works with colleges and institutes, industry training advisory committees and other ministries of government to assist in the development of training programs in the province. In addition, it coordinates a number of professional development activities for instructors and administrators within the B.C. system. The research department coordinates studies related to institutional and program planning. Coordinators are available to provide information or assistance in these areas and to refer instructors and administrators to other specific sources of information available throughout the system. For more information contact:

Research and Curriculum Development Branch
Ministry of Education
7451 Elmbridge Way
Richmond, B.C. V6X 1B8
Telephone: (604) 278-3433

Commercial Materials

There are literally hundreds of books, journal articles and self-help materials available on the subject of competence-based education and its implications for instruction. Those listed here have been chosen on the basis of their general applicability to the B.C. system, and are available through the Provincial Post-Secondary Resource Centre (on inter-library loan) and in many college, institute, and university libraries.

Grant, Gerald et al. **On Competence: A Critical Analysis of Competence-Based Reforms in Higher Education.** San Francisco: Jossey-Bass Publishers, 1979.

An anthology of readings about competence-based education including some case studies of programs in the human services field. Provides an interesting perspective on the history, problems and implications of designing and instructing in the competency model. Also contains a selected bibliography.

Gronlund, Norman E. **Constructing Achievement Tests.** 2nd ed. Englewood Cliffs, N.J.: Prentice-Hall, 1977.

Johnson, Rita B. & Stuart R. Johnson. **Toward Individualized Learning: A Developer's Guide to Self-Instruction.** University of North Carolina: Addison-Wesley, 1975.

This publication models what it preaches. It is a self-instructional package on developing self-instructional packages, created to build skills for this particular mode of instruction. Especially useful to those working towards individualized learning in the classroom or developing instructional units for learning at a distance.

Kemp, Jerrold E. **Instructional Design: A Plan for Unit and Course Development.** San Jose State University: Fearon-Pitman Publishers, 1977.

A complete and eminently readable book which describes, in detail, the Kemp model of instructional design. Also has a useful bibliography classifying other publications by steps in the design process. Classifications include: Instructional Design Systems, Learning Objectives, Learning Theory, Individualized Learning, Instructional Resources, Evaluation, Equipment, Facilities, Future Planning and Accountability.

Kemp, Jerrold E. **Planning and Producing Audiovisual Materials.** Englewood Cliffs, N.J.: Education Technology Publications, 1980.

Mager, Robert F. **Measuring Instructional Intent or Got a Match?** Belmont, Ca.: Fearon Publishers, 1973.

Popham, W. James. **Systematic Instruction.** Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Popham, W. James & Eva L. Baker. **Planning An Instructional Sequence.** Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Renner, Peter F. **The Instructor's Survival Kit.** Vancouver: Training Associates Limited, 1978. Available from publisher at 3364 West 1st Avenue, Vancouver, B.C. V6R 1G4.

This is a delightfully personable handbook which provides practical suggestions under the following headings: Teaching Techniques, Warm-Ups, Communication Skills and Evaluation Tools.

Journal Articles

Trader, Margaret C. "A Checklist for Teaching to an Objective." **Educational Technology,** July 1980.

Bortz, Richard F. "A Model for Developing and Organizing Learning Activities." **Educational Technology,** October 1980.

Wildman, Terry M. "Instructional Design as a Framework for Unifying Curriculum." **Educational Technology,** March 1980.